

REMARKS

Applicants have amended claims 1-2, 15, 26-28, 40, and 56, and have canceled claims 1-25 and 51-54 during prosecution of this patent application. Applicants are not conceding in this patent application that said amended and canceled claims are not patentable over the art cited by the Examiner, since the claim amendments and cancellations are only for facilitating expeditious prosecution of this patent application. Applicants respectfully reserve the right to pursue said amended and canceled claims, and other claims, in one or more continuations and/or divisional patent applications.

The Examiner rejected claims 26-50, 55 and 56 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Stone (US PGPub 2003/0036886) in view of Hickman et al.(US 6,523,036) and further in view of Adiga et al. (US 5,892,913).

Applicants respectfully traverse the § 103 rejections with the following arguments (which include a discussion of new claims 57-58).

35 U.S.C. § 103(a)

The Examiner rejected claims 26-50, 55 and 56 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Stone (US PGPub 2003/0036886) in view of Hickman et al.(US 6,523,036) and further in view of Adiga et al. (US 5,892,913).

Definition of “Directly Connected”

In order to explain the meaning of “directly connected” that appears in independent claims 26 and 28, Applicants cite the specification, page 8, lines 1-7: “Two clusters, denoted as a first cluster and a second cluster in a system of clusters such as, *inter alia*, the system 20 of FIG. 1, are directly connected to each other as a matter of definition if a server S1 of the first cluster and a server S2 of the second cluster are directly connected to each other. The servers S1 and S2 are directly connected to each other as a matter of definition if the communication link that connects S1 and S2 does not include any server that intervenes between S1 and S2. Inclusion of the load balancer of the first or second cluster in said communication link does not negate a direct connection between S1 and S2.”

In addition, the specification, page 8, line 7 - page 9, line 19 discusses concrete examples in Applicants’ Figures to illustrate the meaning of “directly connected”.

Based on the preceding quoted definition in the specification, page 8, lines 1-7, it is clear that necessary conditions for two servers S1 and S2 to be directly connected to each other are:

- (1) S1 and S2 must be connected to each other via a communication link; and
- (2) the communication link that connects S1 and S2 does not include any server that intervenes between S1 and S2.

Claims 26-27, 40-50, and 55-56

Applicants respectfully contend that claim 26 is not unpatentable over Stone in view of Hickman and further in view of Adiga, because Stone in view of Hickman and further in view of Adiga does not teach or suggest each and every feature of claim 26.

An example of why claim 26 is not unpatentable over Stone in view of Hickman and further in view of Adiga is that Stone in view of Hickman and further in view of Adiga does not teach or suggest the feature: “each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link; ... said control server being directly linked to at least two servers in each cluster via a communication channel between the control server and the at least two servers in each cluster”.

The Examiner argues: “Neither Stone nor Hickman et al. teach each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link; said control server being directly linked to at least two servers in each cluster via a communication channel between the control server and the at least two servers in each cluster... In the same field of endeavor Adiga et al. teach an architecture having a plurality of clusters directly connected to each other with a control server directly connected to each server in the cluster (**fig. 6a and 6b, Col. 9 line(s) 64-67- Col. 10 line(s) 1-7**).... Therefore,

it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone's monitoring and control engine for multi-tiered service-level management of distributed web-application servers and Hickman et al. Internet database system with Adiga et al. because Stone and Adiga et al. both teach an architecture having plurality of clusters and monitoring communications with a control server (node monitor), it would have been obvious to one skilled in the art to program the architecture of Adiga et al. to program the substitute architecture with the functionality taught by Stone's to achieve the predictable result.”

In response, Applicants respectfully contend that the Examiner’s argument for modifying stone by the alleged teaching of Adiga is not persuasive, because (1) the Examiner’s suggested modification of Stone by the alleged teaching of Adiga is not enabled; and (2) the Examiner’s suggested modification of Stone by the alleged teaching of Adiga is not obvious to a person of ordinary skill in the art.

In re Kumar, 76 USPQ2d 1048 (Fed. Cir. 2005) is the current controlling case law regarding the requirement that the prior art must enable claimed subject matter. In *In re Kumar*, the Federal Circuit states: “Although published subject matter is "prior art" for all that it discloses, in order to render an invention unpatentable for obviousness, the prior art must **enable** a person of ordinary skill to make and use the invention.... To render **a later invention** unpatentable for obviousness, the prior art must **enable** a person of ordinary skill in the field to make and use the **later invention**.” (emphasis added), *Kumar*, 76 USPQ2d at 1052, 1053.

Thus, based on *In re Kumar*, a rejection of a claim on grounds of obviousness though use of a prior art reference or a combination of prior art references requires that the prior art teach enablement for combining subject matter in the prior art references to make and use the claimed

invention.

The feature in Adiga's architecture that facilitates direct connections between servers in different clusters, and between a control server and servers within clusters, is the ATM switch 186 in FIG. 6A of Adiga. The electrical connections between the servers in each cluster and the ATM switch 186 may be inferred from Adiga, FIG. 4 which shows such details of the electrical connections between servers 94-108 and the ATM switch 88.

Thus, in order to modify Stone by Adiga's architecture to result in the direct connections recited in claim 26, the ATM switch 186 of Adiga would have to be incorporated into Stone. However, there is no teaching in Adiga or elsewhere in the prior art how to incorporate such an ATM switch into Stone and yet preserve all of the existing functionality in Stone. Therefore, the Examiner has the burden of explaining how to modify Stone with Adiga's architecture of incorporating an ATM switch into Stone in a manner that preserves all of the functionality that currently exists in Stone, and also how such an enablement of Stone is taught in the prior art. Since the Examiner has not even considered the enablement issue, Applicants assert that the current rejection of claim 26 over Stone in view of Adiga is legally barred by lack of enablement as required by *In re Kumar*.

If the Examiner were to successfully demonstrate such enablement as required by *In re Kumar*, the next question would be: is it obvious to modify Stone by Adiga's architecture in the enabling manner? Applicants assert that such an enabling modification of Stone would not be obvious to a person of ordinary skill in the art, because such an enabling modification would add unnecessary complexity to Stone's apparatus without adding any advantages in the practice of Stone's invention. Even without considering the enablement issue, the Examiner has not

indicated any increased functionality or other benefit to modifying Stone by Adiga's architecture. Therefore, if modifying Stone by Adiga's architecture adds complexity to Stone's apparatus without adding functionality or other benefit to Stone, then such added complexity is a reason why such a modification of Stone would not be obvious.

In summary, the Examiner has failed to demonstrate:

(1) that modification of Stone by Adiga's architecture is enabled by teachings in the prior art as required by *In re Kumar*;

(2) that such an enabling modification of Stone would preserve all of the functionality that currently exists in Stone; and

(3) that such an enabling modification of Stone would add sufficient functionality or other advantages to Stone so as to justify the added complexity to Stone's apparatus that would result from such an enabling modification of Stone.

Therefore, Stone in view of Hickman and further in view of Adiga Stone does not disclose the preceding feature of claim 26.

Based on the preceding arguments, Applicants respectfully maintain that claim 26 is not unpatentable over Stone in view of Hickman and further in view of Adiga, and that claim 26 is in condition for allowance. Since claims 27, 40-50, 55 and 56 depend from claim 26, Applicants contend that claims 27, 40-50, 55 and 56 are likewise in condition for allowance.

Applicants note that the feature in new claim 57 ("wherein each communication path comprising the communication channel and extending from the control server to the at least one server in each cluster is independent of each communication path comprising the communication

link and extending from each server in the first cluster that is directly connected to the at least one server in the second cluster”) is not disclosed in Adiga, because all communication paths between servers of different clusters, and between a control server and servers within clusters, are not independent of each other as required by the preceding feature of claim 57, because all such communication paths pass through a common path segment of the ATM switch in Adiga. Therefore, it is impossible to modify Stone by the architecture of Adiga in new claim 57.

Claims 28-39

Applicants respectfully contend that claim 28 is not unpatentable over Stone in view of Hickman and further in view of Adiga, because Stone in view of Hickman and further in view of Adiga does not teach or suggest each and every feature of claim 28.

A first example of why claim 26 is not unpatentable over Stone in view of Hickman is that Stone in view of Hickman does not teach or suggest the feature: “each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link”.

The Examiner argues: “Neither Stone nor Hickman et al. teach each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link... In the same field of endeavor Adiga et al. teach an

architecture having a plurality of clusters directly connected to each other with a control server directly connected to each server in the cluster (**fig. 6a and 6b, Col. 9 line(s) 64-67- Col. 10 line(s) 1-7**).... Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone's monitoring and control engine for multi-tiered service-level management of distributed web-application servers and Hickman et al. Internet database system with Adiga et al. because Stone and Adiga et al. both teach an architecture having plurality of clusters and monitoring communications with a control server (node monitor), it would have been obvious to one skilled in the art to program the architecture of Adiga et al. to program the substitute architecture with the functionality taught by Stone's to achieve the predictable result.”

In response, Applicants respectfully contend that the Examiner’s argument for modifying stone by the alleged teaching of Adiga is not persuasive, because (1) the Examiner’s suggested modification of Stone by the alleged teaching of Adiga is not enabled; and (2) the Examiner’s suggested modification of Stone by the alleged teaching of Adiga is not obvious to a person of ordinary skill in the art.

In re Kumar, 76 USPQ2d 1048 (Fed. Cir. 2005) is the current controlling case law regarding the requirement that the prior art must enable claimed subject matter. In *In re Kumar*, the Federal Circuit states: “Although published subject matter is "prior art" for all that it discloses, in order to render an invention unpatentable for obviousness, the prior art must **enable** a person of ordinary skill to make and use the invention.... To render **a later invention** unpatentable for obviousness, the prior art must **enable** a person of ordinary skill in the field to make and use the **later invention**.” (emphasis added), *Kumar*, 76 USPQ2d at 1052, 1053.

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The feature in Adiga's architecture that facilitates direct connections between servers in different clusters is the ATM switch 186 in FIG. 6A of Adiga. The electrical connections between the servers in each cluster and the ATM switch 186 may be inferred from Adiga, FIG. 4 which shows such details of the electrical connections between servers 94-108 and the ATM switch 88.

Thus, in order to modify Stone by Adiga's architecture to result in the direct connections recited in claim 26, the ATM switch 186 of Adiga would have to be incorporated into Stone. However, there is no teaching in Adiga or elsewhere in the prior art how to incorporate such an ATM switch into Stone and yet preserve all of the existing functionality in Stone. Therefore, the Examiner has the burden of explaining how to modify Stone with Adiga's architecture of incorporating an ATM switch into Stone in a manner that preserves all of the functionality that currently exists in Stone, and also how such an enablement of Stone is taught in the prior art. Since the Examiner has not even considered the enablement issue, Applicants assert that the current rejection of claim 26 over Stone in view of Adiga is legally barred by lack of enablement as required by *In re Kumar*.

If the Examiner were to successfully demonstrate such enablement as required by *In re Kumar*, the next question would be: is it obvious to modify Stone by Adiga's architecture in the enabling manner? Applicants assert that such an enabling modification of Stone would not be

obvious to a person of ordinary skill in the art, because such an enabling modification would add unnecessary complexity to Stone's apparatus without adding any advantages in the practice of Stone's invention. Even without considering the enablement issue, the Examiner has not indicated any increased functionality or other benefit to modifying Stone by Adiga's architecture. Therefore, if modifying Stone by Adiga's architecture adds complexity to Stone's apparatus without adding functionality or other benefit to Stone, then such added complexity is a reason why such a modification of Stone would not be obvious.

In summary, the Examiner has failed to demonstrate:

(1) that modification of Stone by Adiga's architecture is enabled by teachings in the prior art as required by *In re Kumar*;

(2) that such an enabling modification of Stone would preserve all of the functionality that currently exists in Stone; and

(3) that such an enabling modification of Stone would add sufficient functionality or other advantages to Stone so as to justify the added complexity to Stone's apparatus that would result from such an enabling modification of Stone.

Therefore, Stone in view of Hickman and further in view of Adiga Stone does not disclose the preceding feature of claim 28.

A second example of why claim 28 is not unpatentable over Stone in view of Hickman is that Stone in view of Hickman does not teach or suggest the feature: "monitoring an operational status of a first communication link between a first server of the first cluster and a second server of the second cluster, said monitoring being performed by the control server, said monitoring

including sending a query signal to the first server, said query signal requesting the first server to send a response signal to the control server indicating the status of the first communication link, said operational status of the first communication link being that said first communication link is operational or non-operational” (emphasis added).

The Examiner argues: “Stone disclose ... (§0044, teaches that the node monitor is able to test links from other networks other than it's specific cluster to determine the operational status. Likewise, 110078, teach the node monitor testing the communication links by using the conventional method of pinging. Therefore, when using this method a reply is requested and returned).”

In response, Applicants respectfully contend that the Examiner has incorrectly described Stone, §0044 which recites: “Node monitor 28 monitors the nodes for web servers 21, 22, 23, and can also monitor any **sub-networks associated with these nodes**” (emphasis added). In other words, Stone, §0044 does not teach that a node monitor is able to monitor an operational status of a communication link between servers different clusters as required by claim 28. Instead, Stone, §0044 teaches that a node monitor is able to monitor an operational status of sub-networks of servers within the cluster that the node monitor is associated with.

In “Response to Arguments”, the Examiner argues: “The Examiner asserts that Stone does teach the control server (node monitor) is able to monitor the operational status of a communication link between servers in a different cluster (§0044 and §0078) since the control server (node monitor) is directly connected to at least one server in each cluster (**fig. 12**), as also stated in claim 28. Likewise, as pointed out by the applicant (pg. 18, remarks) Stone defines the monitoring of the node monitor (**10044**) by, “Node monitor 28 monitors the nodes for web

servers 21, 22, 23, and can also monitor **any sub-networks associated with these nodes**" (emphasis added). Therefore due to the connection of at least one server in each cluster to that node monitor, each cluster would be classified as sub-network associated with the first cluster."

In response to the preceding argument by the Examiner in "Response to Arguments", Applicants respectfully contend that the Examiner has incorrectly interpreted the meaning of the text in Stone, ¶0044. As the Examiner correctly states, ¶0044 in Stone recites "Node monitor 28 monitors the nodes for web servers 21, 22, 23, and can also monitor any sub-networks associated with these nodes". However, "these nodes" in the phrase "any sub-networks associated with these nodes" have antecedent basis "the nodes for web servers 21, 22, 23" and therefore refer only to nodes within cluster 20 (see Stone, FIG. 12).

The preceding interpretation by Applicants of ¶0044 in Stone is confirmed by ¶0045 in Stone which recites as follows an example relating to ¶0044 in which "these nodes" consist only of nodes that are totally contained within cluster 20: "For example, when the node containing web server 22 fails, local agent 25 running on the same machine is unable to notify service agent 27. Instead, node monitor 28 notifies service agent 27 of the node's failure. Service agent 27 can then take corrective action, such as instructing a load balancer to stop sending requests to web server 22. The node can be automatically restarted and service-component software re-loaded by service agent 27, or if that fails, the administrator can be notified."

Stone, ¶0046 describes a similar example for cluster 30, and yet another similar example for cluster 40. Stone does not supply any examples that support the Examiner's interpretation of Stone, ¶0044.

Furthermore, Stone, ¶0078 teaches that the node monitor can periodically ping a node,

which would enable the node monitor to monitor an operational status of the node that is pinged. However, Stone, ¶0078 does not teach that the node monitor can monitor the operational status of a communication link between servers of different clusters as required by claim 28.

Therefore, Stone in view of Hickman and further in view of Adiga Stone does not disclose the preceding feature of claim 28.

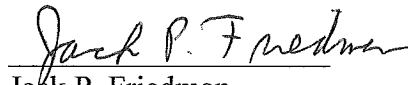
Applicants note that the feature in new claim 58 (“wherein each communication path comprising the communication channel and extending from the control server to the at least one server in each cluster is independent of each communication path comprising the communication link and extending from each server in the first cluster that is directly connected to the at least one server in the second cluster”) is not disclosed in Adiga, because all communication paths between servers of different clusters, and between a control server and servers within clusters, are not independent of each other as required by the preceding feature of claim 58, because all such communication paths pass through a common path segment of the ATM switch in Adiga. Therefore, it is impossible to modify Stone by the architecture of Adiga in new claim 58.

Based on the preceding arguments, Applicants respectfully maintain that claim 28 is not unpatentable over Stone in view of Hickman and further in view of Adiga, and that claim 28 is in condition for allowance. Since claims 29-39 depend from claim 28, Applicants contend that claims 29-39 are likewise in condition for allowance.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0457 (IBM).

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